

Each of amended claims 1, 19, 29, 30, 36, and 40 essentially require the ability to generate a measured or calculated value based upon a sensor signal and the ability to control the mechanical press in accordance with the comparison of that value 5 to a plurality of severity operating zones, each severity operating zone defining a relative level of potential long-term operating reliability for a mechanical press. Applicant submits that such an invention as set forth in each of independent claims 1, 19, 29, 30, 36, and 40 is neither taught, disclosed, nor 10 suggested by Hasley et al, Canada et al, or any of the other cited references, alone or in combination.

Hasley et al '757 discloses a predictive vibration monitoring system that is able to process a sensor signal generated thereby into corresponding vibration data for the 15 monitored machine. The microcontroller of the system is able to compare the corresponding vibration data with predetermined data to predict the present and future condition of at least one operating portion of the machine. Fig. 2 of Hasley et al shows an actual footprint or vibration signature which has been 20 obtained under a known machine state and from an individual sensor 12, having a known predetermined location. Each sensor 12 provides vibration data to produce a signal vibration signature. Overlying each vibration signal is an alarm level. The alarm level is employed by the vibration monitoring system to indicate

predetermined maximum levels above which machine fault conditions may occur to the monitored machine. As such, Hasley et al effectively only discloses a single severity operating zone, only indicating maximum levels above which fault conditions may occur.

5 This is unlike the present invention, which shows a plurality of severity zones, which together provide an increased ability to predict the long-term operating ability of the machine. Thus, Hasley et al '757 fails to teach or suggest the present invention as set forth in each of amended claims 1, 19, 29, 30, 36, and 40.

10 Canada et al '811 discloses a hand-held data collector and analyzer system for use to collect vibration data from machines for use in producing maintenance requirements. However, Canada et al does not disclose or suggest comparing this collective data to any sort of severity operating zones. Therefore, Canada et al '811 fails to teach or suggest the present invention as set forth in each of claims 1, 19, 29, 30, 36, and 40, as amended, and is not able to overcome the shortcomings associated with Hasley et al.

20 For all the foregoing reasons, Applicants submit that claims 1, 19, 29, 30, 36, and 40, and those claims depending therefrom, are now in condition for allowance and hereby respectfully request the rejection thereof based upon Hasley et al '757 and Canada et al '811 be withdrawn.

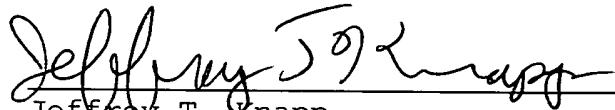
Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hasley et al and Canada et al in view of U.S. Patent No. 4,302,813 (Kurihara et al). However, claim 6 depends from claim 1, which is in condition for allowance for the reasons 5 set forth above. Accordingly, Applicant submits that claim 6 is also in condition for allowance, the allowance of which is hereby respectfully requested.

Claims 9, 10, and 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hasley et al and Canada et al 10 in view of U.S. Patent No. 5,802,151 (Bevill, Jr. et al). However, claims 9 and 10 depend from claim 1, and claims 20-22 depend from claim 19. Since claims 1 and 19 are in condition for allowance for the reasons set forth above, Applicant submits that 15 claims 9, 10, and 20-22 are also in condition for allowance. The allowance of which is hereby respectfully requested.

Furthermore, Bevill, Jr. et al discloses a telephone interface protection circuit and a modem incorporating the telephone interface protection circuit. Since Hasley et al does not disclose a system which expressly has a telephone circuit, 20 Hasley et al does not present any systematic problem to which Bevill, Jr. et al could be directed. Thus, there is no motivation to combine Bevill, Jr. et al with the primary reference Hasley et al.

If the Examiner has any questions or comments that would speed prosecution of this case, the Examiner is invited to call the undersigned at 260/485-6001.

Respectfully submitted,



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Encs: Replacement Claims
Marked-up Claims
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Jeffrey T. Knapp, Regis. No. 45,384
Name of Registered Representative


Signature
May 13, 2003

Date



REPLACEMENT CLAIMS

Please replace claim 1 with the following:

1. A device for monitoring the operation of a mechanical press, comprising:

an at least one signal generator;

5 a signal conditioner operatively connected to said at least one signal generator, for calculating a value from said at least one generated signal, said signal conditioner being configured for relating said calculated value to one of a plurality of severity operating zones;

a display operatively connected to said signal conditioner;

10 and

a control unit configured to selectively control said mechanical press in accordance with said calculated value in relation to a plurality of severity operating zones, each said severity operating zone defining a relative level of a potential

15 long-term operating reliability for said mechanical press, said calculated value being received from said signal conditioner and/or said display.

Please replace 19 with the following:

19. A device attachable to a mechanical press for measuring press conditions, said device comprising:

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REPLACEMENT CLAIMS

an at least one accelerometer for measuring press conditions and creating a corresponding signal;

5 a signal processing means for processing said corresponding signal, said signal processing means connected to said at least one accelerometer to process said corresponding signal, said signal processing means comprising:

10 an acceleration processing means for calculating a press acceleration value;

 a velocity processing means for calculating a press velocity value;

 a displacement processing means for calculating a press displacement value;

15 a display means for displaying at least one of said calculated values;

 a switch permitting an operator to select one of said calculated values for input to said display means; and

20 a control unit configured to selectively control said mechanical press in accordance with at least one said calculated value from said signal processing means and/or said display means, said control unit being configured for relating each said at least one said calculated value to one of a plurality of severity operating zones as a basis for control of said

REPLACEMENT CLAIMS

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mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

Please replace claim 29 with the following:

D3
29. A method of monitoring the long-term reliability of a mechanical press, comprising:

5 generating a unique press vibration severity/reliability zone chart including a plurality of severity operating zones, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press;

monitoring the vibration severity of [the] said mechanical press;

10 outputting the monitored vibration severity and the corresponding severity operating zone; and

selectably controlling said mechanical press in accordance with the monitored vibration severity and the corresponding severity operating zone therefor.

Please replace claim 30 with the following:

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30. A system in combination with a press machine and a press machine sensor assembly, , said processor outputting a calculated value; said system comprising:

REPLACEMENT CLAIMS

5 a press machine vibration monitoring apparatus, said press vibration monitoring apparatus being operatively coupled to said press machine sensor assembly, said press machine vibration monitoring apparatus comprising:

24 a processor to process sensor signals generated by said press machine sensor assembly; and

10 a controller being operatively coupled to said processor, said controller being configured to selectively control said press machine, said controller being configured for relating said calculated value to a plurality of severity operating zones as a basis of control of said mechanical press, each said severity 15 operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

Please replace claim 36 with the following:

36. An apparatus in combination with a press machine and a press machine sensor assembly, said apparatus comprising:

125 a press machine vibration measurement device operatively coupled to said press machine sensor assembly, said press 5 machine vibration measurement device being configured for generating a measurement value; and

a press machine controller operatively coupled to said press machine vibration measurement device, said press machine controller being configured for relating said measurement value

REPLACEMENT CLAIMS

10 to one of a plurality of severity operating zones as a basis for control of said mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

Please replace claim 40 with the following:

40. A method in combination with a press machine, said method comprising the steps of:

5 sensing and measuring vibration activity in said press machine; and

selectably controlling press machine operation in accordance with the vibration activity measurement, the vibration activity measurement being related to one of a plurality of severity operating zones as a basis for control of said mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.



MARKED-UP CLAIMS

Please amend claim 1 as follows:

1. A device for monitoring the operation of a mechanical press, comprising:

an at least one signal generator;

a signal conditioner operatively connected to said at least one signal generator, for calculating a value from said at least one generated signal, said signal conditioner being configured

5 one signal generator, for calculating a value from said at least one generated signal, said signal conditioner being configured for relating said calculated value to one of a plurality of severity operating zones;

a display operatively connected to said signal conditioner;

10 and

a control unit configured to selectively control said mechanical press in accordance with [signals] said calculated value in relation to a plurality of severity operating zones, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press, said calculated value being received from said signal conditioner and/or said display.

13. The device of Claim 1, wherein said control unit further comprising a press machine controller for controlling press functions in response to said calculated values from said signal conditioner.

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MARKED-UP CLAIMS

5 ***Please amend 19 as follows:***

19. A device attachable to a mechanical press for measuring press conditions, said device comprising:

an at least one accelerometer for measuring press conditions and creating a corresponding signal;

5 a signal processing means for processing said corresponding signal, said signal processing means connected to said at least one accelerometer to process said corresponding signal, said signal processing means comprising:

an acceleration processing means for calculating a press acceleration value;

10 a velocity processing means for calculating a press velocity value;

 a displacement processing means for calculating a press displacement value;

15 a display means for displaying at least one of said calculated values;

 a switch permitting an operator to select one of said calculated values for input to said display means; and

20 a control unit configured to selectively control said mechanical press in accordance with [signals] at least one said calculated value from said signal processing means and/or said

MARKED-UP CLAIMS

display means, said control unit being configured for relating each said at least one said calculated value to one of a plurality of severity operating zones as a basis for control of
25 said mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

24. The device of Claim 19, wherein said control unit further comprising a press machine controller for controlling press functions in response to said calculated values.

Please amend claim 29 as follows:

29. A method of monitoring the long-term reliability of a mechanical press, comprising:

generating a unique press vibration severity/reliability zone chart including a plurality of severity operating zones, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press;

monitoring the vibration severity of [the] said mechanical press;

10 outputting the monitored vibration severity and the corresponding [vibration] severity[/reliability] operating zone; and

MARKED-UP CLAIMS

selectably controlling said mechanical press in accordance with the monitored vibration severity and the corresponding severity operating zone therefor.

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Please amend claim 30 as follows:

30. A system in combination with a press machine and a press machine sensor assembly, , said processor outputting a calculated value; said system comprising:

a press machine vibration monitoring apparatus, said press vibration monitoring apparatus being operatively coupled to said press machine sensor assembly, said press machine vibration monitoring apparatus comprising:

a processor to process sensor signals generated by said press machine sensor assembly; and

10 a controller being operatively coupled to said processor, said controller being configured to selectably control said press machine , said controller being configured for relating said calculated value to a plurality of severity operating zones as a basis of control of said mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

15 31. The system as recited in Claim 30, wherein said controller being configured further to control said press machine in accordance with processed sensor signals received from said

MARKED-UP CLAIMS

processor.

32. The system as recited in Claim 30, wherein said processor being configured to generate relative to said press machine at least one of an acceleration measurement, a velocity measurement, and a displacement measurement.

33. The system as recited in Claim 30, wherein said press machine sensor assembly includes at least one accelerometer.

34. The system as recited in Claim 30, further includes a display operatively coupled to said processor.

35. The system as recited in Claim 30, wherein said press machine vibration monitoring apparatus defining a built-in element of said press machine.

Please amend claim 36 as follows:

36. An apparatus in combination with a press machine and a press machine sensor assembly, said apparatus comprising:

a press machine vibration measurement device operatively coupled to said press machine sensor assembly, said press machine vibration measurement device being configured for generating a measurement value; and

a press machine controller operatively coupled to said press machine vibration measurement device, said press machine controller being configured for relating said measurement value to one of a plurality of severity operating zones as a basis for

MARKED-UP CLAIMS

control of said mechanical press, each said severity operating zone defining a relative level of a potential long-term operating reliability for said mechanical press.

37. The apparatus as recited in Claim 36, wherein said press machine vibration measurement device further comprises a press acceleration determination unit, a press velocity determination unit, and/or a press displacement determination unit.

38. The apparatus as recited in Claim 36, further comprises: a display operatively coupled to said press machine vibration measurement device and/or said press machine controller.

39. The apparatus as recited in Claim 36, wherein said apparatus having a built-in configuration relative to said press machine.

Please amend claim 40 as follows:

40. A method in combination with a press machine, said method comprising the steps of:

sensing and measuring vibration activity in said press machine; and

5 selectably controlling press machine operation in accordance with the vibration activity measurement, the vibration activity measurement being related to one of a plurality of severity operating zones as a basis for control of said mechanical press,

MARKED-UP CLAIMS

10 each said severity operating zone defining a relative level of a
 potential long-term operating reliability for said mechanical
 press.

41. The method as recited in Claim 40, further comprises the
step of:

5 providing a built-in press machine vibration monitoring
device configured to perform the vibration activity measurement
and/or the press machine operation control.

42. The method as recited in Claim 40, further comprises the
step of:

displaying the vibration activity measurement and/or a
representation thereof.

43. The method as recited in Claim 40, further comprises the
step of:

5 performing at least one of an alarm notification task, a
vibration-related data storage task, a diagnostic task, and/or a
remote vibration-related data communication task, using the
vibration activity measurement.